

Air Products Introduces EXTREMA(R) Precursors for Next Generation Memory Applications

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Cell Phones, Mobile Computing Drive Trend for Advanced Memory Chips

LEHIGH VALLEY, Pa., June 2, 2010 /PRNewswire via COMTEX/ --Air Products (NYSE: APD) today introduced its new EXTREMA(R) STO and GST precursors in support of continued advancements in Dynamic Random Access Memory (DRAM) and Phase-change Random Access Memory (PRAM) devices. The rapid growth in cell phone technology and mobile computing continues to drive DRAM development while PRAM is viewed as a possible solution to the increasing need for higher capacity data storage to support growth in server computing.

Air Products' EXTREMA(R) STO precursors improve manufacturers' ability to better deposit ultra-high k dielectric films using atomic layer deposition (ALD) for use in 22 nm to 15 nm DRAM devices. "STO is a crystalline compound, Strontium Titanium Oxide, which has an exceptionally high dielectric constant. This facilitates the further miniaturization of the memory element, increasing the amount of data stored on each chip," said Dr. Laura Matz, technical manager for advanced memory materials at Air Products. "Air Products' EXTREMA(R) Sr and EXTREMA(R) Ti STO precursors have been employed to deposit STO films which exhibit high dielectric constant and low electrical leakage. These are critical performance factors for our customers."

Air Products' EXTREMA(R) GST precursors allow thermal ALD of conformal films critical to the manufacture of PRAM devices at 22 nm and below. "GST is an alloy of Germanium, Antimony (chemical symbol Sb) and Tellurium which can be made to change phase under the influence of temperature. It has been the basis of optical storage devices such as DVD-RW for some time and is now being readied for use in solid state memory," said Matz. "Air Products' EXTREMA(R) Ge, EXTREMA(R) Sb and EXTREMA(R) Te GST precursors have been employed to deposit conformal GST films with good compositional uniformity. This attribute is critical for fabricating the confined contacts present in PRAM devices."

"A key feature of these precursors is that they work together to enable compositional control of challenging new films. Until now, semiconductor devices have generally employed simple, binary films (such as Hafnium Oxide) which comprise only two elements (Hafnium and Oxygen)," said Dr. Iain Buchanan, commercial development manager for advanced memory materials. "More recent structures have employed laminates of two binary films (e.g. Zirconium Oxide and Aluminium Oxide) to improve performance. However, the harmonious use of three elements to form a single, precisely controlled ternary film has presented a significant challenge to semiconductor manufacturers. We're pleased to offer our customers a solution to this problem."

Air Products will be presenting these materials at the upcoming ALD2010 Conference in Seoul, Korea from June 20 to 23. For more information on this conference, visit <http://ald2010.snu.ac.kr/>.

For more information on the EXTREMA(R) STO and GST precursors, visit www.airproducts.com/Electronics/Technologies/High-K.htm

Air Products (NYSE: APD) serves customers in industrial, energy, technology and healthcare markets worldwide with a unique portfolio of atmospheric gases, process and specialty gases, performance materials, and equipment and services. Founded in 1940, Air Products has built leading positions in key growth markets such as semiconductor materials, refinery hydrogen, home healthcare services, natural gas liquefaction, and advanced coatings and adhesives. The company is recognized for its innovative culture, operational excellence and commitment to safety and the environment. In fiscal 2009, Air Products had revenues of \$8.3 billion, operations in over 40 countries, and 18,900 employees around the globe. For more information, visit www.airproducts.com.

***NOTE: This release may contain forward-looking statements. Actual results could vary materially, due to changes in current expectations.

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